EXHIBIT 17

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Defendants' Expert Witness Rebuttal to Plaintiffs' Expert Report

Joanne Hart and Sandra Bueno, Plaintiffs

vs.

BHH, LLC d/b/a Bell + Howell and VAN HAUSER LLC, Defendants

Case No. 1:15-CV-04804-WHP

Prepared for

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EXHIBIT 2
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Introduction

As submitted, the Defendant's Expert Disclosure in the above captioned matter, authored by Dr. Paul W. Borth, BCE and dated October 31, 2017, includes 20 opinions that lead to conclusions contradicting certain of the opinions and conclusions expressed in the Expert Report of Dr. Michael F. Potter, likewise submitted. Having now had the opportunity to read Dr. Potter's report and all its appendices, I raise the points in this report in rebuttal and as a supplement to my earlier report. I reserve the right to offer additional opinions and further supplement my opinions and report to the extent any other additional information is obtained, including that pursuant to the subpoenas that have been issued in this matter.

My report will call into question and expose the inadequacies of the commissioned insect and spider tests performed by i2L Research USA Inc. (i2LR) that Dr. Potter used in an attempt to prove that the B+H Ultrasonic Repeller model #50167 is ineffective. I provide an alternative setup that would have eliminated many of the noted deficiencies.

Using the same chi-square testing methodology included in my previous report, I demonstrate that the paired control chambers used in the i2LR experiments failed to operate as necessary. Without statistically valid controls, the results of the spider and ant experiments are flawed, as are any conclusions derived therefrom.

Looking at all the i2LR raw data instead of a select subset, I show that the B+H Ultrasonic Pest Repeller #50167 efficacy results are mixed and that Dr. Potter's generalized conclusion that the Repeller "*... was not effective at repelling cockroaches, spiders or ants during the trial duration*", is inaccurate and misleading.

I draw on my extensive career experience in pest management product development to make the point that it is standard practice in the industry to use the data in hand as the basis for writing, reviewing and approving product literature. I make the point that it's reasonable, not unexpected, that Intellitec relied upon the data in hand as the basis for the product literature accompanying their Ultrasonic Repellers.

Past studies that did not include Bell + Howell Ultrasonic Repellers in the treatment list are irrelevant to the matter at hand. I base this opinion upon direct and indirect statements contained within three references that Dr. Potter actually uses to claim otherwise and make risky inferences. He weakens his position by not addressing these contradictions.

Erroneous and exaggerated statements used throughout Dr. Potter's report with regard to the B+H Ultrasonic Repeller Packaging and Owner's Manual will be highlighted as symbolic of the bias that he holds against ultrasonic technology and is carried through the entirety of the logic and process that he used in preparing for and writing his Expert Report, including the commissioned i2LR research.

Numbered List of References

The following reference materials were used in preparing this report:

1.	Borth, P. W. October 31, 2017. Defendant's Expert Disclosure. Hart and Bueno, Plaintiffs, vs. BHH, LLC and VAN HAUSER, LLC, Defendants. Case No. 1:15-CV-04804-WHP

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2.	Potter, M. F. October 31, 2017. Expert Report of Dr. Michael F. Potter. Hart and Bueno, Plaintiffs, v. BHH, LLC and VAN HAUSER, LLC, Defendants. Civil Action No. 1:15-CV-04804-WHP
3.	Hostetler, J. October 2017. Laboratory bioassay to assess the efficacy of an ultrasonic device at repelling cockroaches, ants, and spiders. I2LResearch USA, Inc., Baltimore, MD. *Included as Appendix 4 of Reference 2.*
4.	QMANN Report# 10275-1; Report Date: 2010-11-20; Model Tested: 50153; aka Feuerstein Deposition Exhibit 23, Feuerstein-23.pdf. *Included in Reference 1.*
5.	QMANN Report# 10275-2; Report Date: 2010-11-20; Model Tested: 50161; aka Feuerstein Deposition Exhibit 22 (= Exhibit 24), Feuerstein-22.pdf. *Included in Reference 1.*
6.	SGS Report#: SZXWT00603439; Date: 23-MAR-2012; Model Tested: not stated; BHH, LLC.000022-000039. *Included in Reference 1.*
7.	Intertek Report#: 140515021GXU-002; Date: July 7, 2014; Model Tested: 50167; BHH, LLC.000042-000052. *Included in Reference 1.*
8.	Intertek Report#: 160419051GZU-002; Date: April 7, 2016; Model Tested: 50167 (from photo on p. 2); 160419051GZU-002.pdf. *Included in Reference 1.*
9.	SGS Report#: AFL20160214GZ-2; Date: May 25, 2016; Model Tested: not stated; SGS-AFL20160214GZ-2 Testing Witness Report Confirm. *Included in Reference 1.*
10.	Mallis, A. 2011. Handbook of Pest Control, Tenth Edition. Stoy A. Hedges, Editorial Director.
11.	Lee, C. Y. and Soo, J. A. C. 2002. Impact of starvation on intrinsic rate of increase (r_n) of the German cockroach, *Blatella germanica* (L.) (Dictyoptera: Blattellida), in the presence of an insecticidal bait. Tropical Biomedicine 19(1&2): 103-108.
12.	Lee, C. Y. and Heng, C. Y. 2000. Effects of food and water deprivation on nymphal development, adult fecundity and insecticide susceptibility in German cockroaches, *Blatella germanica* (L.). Tropical Biomedicine 17: 27-34.
13.	El-Sharabasy, et al. 2014. Food preference of the German cockroach, *Blattella germanica* (L.) (Dictyoptera: Blattellidae). Cercetari Agronomice in Moldova Vol.xLVII, No. 2 (158).
14.	Barbani, L. E. 2003. Foraging activity and food preferences of the odorous house ant (*Tapinoma sessile* Say) (Hymenoptera: Formicidae). M.S. Thesis, Virginia Polytechnic Institute and State University.
15.	Mallis, A. 1982. Handbook of Pest Control, Sixth Edition. Keith Story, Editorial Director.
16.	Edwards, G. B. 2016. Common house spider: Introduction, Synonymy, Description, Diagnosis, Habits and Habitat, Selected References. Florida Department of Agriculture and Consumer Services, Division of Plant Industry. Publication Number: EENY-238. https://edis.ifas.ufl.edu/pdffiles/IN/IN39400.pdf
17.	Turnbull, A. L. 1964/2012. The search for prey by a web-building spider *Acaearanea tepidariorum* (C. L. Koch) (Araneae, Theridiidae). The Canadian Entomologist 96:568-579. https://doi.org/10.4039/Ent96568-3
18.	Bell+Howell Ultrasonic Pest Repellers Item No. 50167BCDW4, Packaging and Owner's Manual, 4 pack, 4 Room Solution, 3 pp.
19.	Ballard, J. B., R. E. Gold, and T. N. Decker., 1984. Response of German Cockroach (Orthoptera: Blattellidae) Populations to a Frequency Sweeping Ultrasound-Emitting Device. J. Econ. Entomol. 77:976-979. *Included in Reference 1.*

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20.	Subramanyam, B. 2003. Ultrasound and arthropod pest control: Hearing is Believing. http://www.grains.k-state.edu/spirel/docs/research/ultrasound-ipm/presentation/SCJ%20talk.pdf *Included in Appendix 6 of Reference 2.*
21.	Koehler, P. G, R. S. Patterson, and J. C. Webb. 1986. Efficacy of ultrasound for German cockroach (*Blatella germanica*) (Orthoptera: Blattellidae) and oriental rat flea (*Xenopsylla cheopsis*) (Siphonaptera: Pulicidae) control. Journal of Economic Entomology. 79:1027-1031. Included *in Appendix 6 of Reference 2.*
22.	Eberhard, W. G. Notes on the ecology and behavior of *Physocyclus globosus* (Araneae, Pholcidae). 1992. Bull. Br. Arachnol. Soc. (1992) 9 (2), 38-42.
23.	17-359 Raw Data –Confidential.xlsx. i2LR Excel file. *Subpoenaed document.*
24.	German cockroach records – Confidential.pdf. Handwritten notes. *Subpoenaed document.*
25.	Test system log for 17-359 – Confidential.pdf. Handwritten notes. *Subpoenaed document.*
26.	Huang, F., et al. 2002. Laboratory and field trials with commercial ultrasonic devices against three ant species (Hymenoptera: Formicidae). J. Agric. Urban Entomol. 19(1): 25-28 (January 2002). *Subpoenaed document.*
27.	Huang, F. and B. Subramanyam. 2006. Lack of repellency of three commercial ultrasonic devices to the German cockroach (Blattodea: Blattellidae). Insect Science (2006) 13, 61-66. *Subpoenaed document.*

Note: For simplicity, any mention of "Dr. Potter's Expert Report or Dr. Potter's Report" is Reference 2, above. Any mention of "i2LR Report" is Reference 3, above. Any mention of "Intellitec protocol" is Reference 4 – 9, above.

Deficiencies Inherent in the i2L Research Protocol and Experimental Design

Insect and Spider Tests

Device Pairing

No negative control was paired with the positive control for any of the chambers or replicates. It would have been enlightening had i2LR mounted a B+H Ultrasonic Pest Repeller model #50167 in exactly the same way and in the same orientation on each of the paired Release/Non-Release Chambers for each replicate. Without controlling for the physical presence of the Repeller (negative control = present, but not turned on), the researchers must operate under the assumption that the mere presence of the device did not contribute to the observed behavior of the insects and spiders.

Not counting all cockroaches or spiders

In the i2LR report (p. 9), the researchers state that *"Only in the interior of the cardboard connecting tube were assessments not made in the case for cockroaches and spiders."* Organisms that were in the connecting tube were, by definition, not in the Release Chamber and, therefore, should have been counted and included with the subset of organisms found in the Non-Release Chamber. This is a fundamental flaw in experimental protocol, quite possibly leading to erroneous statistical analysis and conclusions for cockroaches and spiders. Given the unidirectional ultrasound waves emanating from the

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top of the Release Chamber, any cockroaches and spiders found in the connecting tube would be in a sound shadow, possibly taking shelter from the ultrasound (i.e., repelled). Unfortunately, this deficiency in experimental protocol, inherently biases the results against the effectiveness of the B+H Ultrasonic Pest Repeller model #50167.

Incomplete/Missing Daily Data

In the i2LR report (page 9), the researchers state that visual counts of the arthropods were made on 5 of 7 days, 5 of 8 days and 5 of 11 days for the spiders, ants and cockroaches, respectively. While the proportion of missing data varies by arthropod, overall 58% (15 of 26 possible assessment days) of the data are missing. Had these data been collected, the conclusions of the Plaintiffs' commissioned research may have been different – there is no way of knowing.

Visual counts taken once per day

Under the heading, "Defendants' Flawed Experiments Yield False Conclusions", Dr. Potter writes in his Expert Report (para 85), that,

> *"Investigators asserted that any pests that "stayed" in a chamber without a device were considered repelled, while any remaining in chambers with a device were not repelled. They based this assumption on a visual count taken once per day; it does not consider where pests were located throughout the previous 24-hour period."*

Exactly like the Intellitec Protocol, the i2LR Report indicates that, "*... visual counts were taken once per day*". Whatever flaw that Dr. Potter attributes to the Intellitec experiment because *"[not considering] where pests were located throughout the previous 24-hour period"* applies equally to the very protocol that, he, himself collaborated upon that yielded, in his words, *"false conclusions"*.

No food/water consumption data reported

Under the heading, "Defendants' Flawed Experiments Yield False Conclusions", Dr. Potter writes in his Expert Report (para 85), that,

> *"Daily measurement of food and water consumed suggested sustained movement of pests between chambers with and without a device ... The fact that this occurred even on days when no pests were observed in the chamber with the device suggests such movements may have been occurring at night."*

Having the benefit of reviewing the Intellitec protocol in advance of the i2LR testing, it is curious why Dr. Potter did not require the Plaintiffs' commissioned researchers to also measure daily food and water consumption, not only to supplement the count data (as Intellitec did), but also test for any pest movements that may have been occurring at night, which he implies is an important consideration. Once again, whatever flaw that Dr. Potter attributes to the Intellitec experiment for measuring food and water consumption is not valid since he overlooked the need for daily food and water consumption data in the protocol that he, himself, collaborated upon that yielded, in his words, *"false conclusions"*.

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i2LR German cockroach and Odorous house ant test results are invalid

The i2LR report authors and Dr. Potter, in his Expert Report, go to great lengths describing the use of and rationale for using "harborages" to introduce the German cockroach and Odorous house ant specimens into the "Release Side" chamber of each of the replicates. This zealous attempt to simulate *"a more natural environment during the study"* (Potter, para 31) was a critical oversight that materially rendered the results invalid and "inconclusive" for answering the question central to the above captioned matter.

How could the main effect of "repellency" be tested when there was no negative control for the presence of harborages which Dr. Potter unequivocally states affect the locomotive behavior of these insects? The very statement that Dr. Potter makes that he was attempting to *"simulate a more natural environment"* (Potter, para 31) with the harborage is precisely what invalidates the i2LR experiments and is responsible for their inconclusive results with respect to the question of interest, e.g., Does a B+H Ultrasonic Repeller #50167 repel German cockroaches and Odorous house ants? This is true because the insects were introduced to the chamber in a harborage, which served to protect them from the repelling ultrasounds of the device. It is no surprise to me that the majority of the cockroaches and ants did not exit their sound-protective harborages as doing so would have exposed them to the device ultrasounds meant to repel them.

To make their case, the i2LR researchers should have, but neglected to produce any evidence to reject the null hypothesis, H_o: *German cockroaches and Odorous house ants remain in the sound shadow of a harborage to avoid the repellent ultrasound effects of the B+H Ultrasonic Pest Repeller #50167.* This is a valuable H_o, as scientifically designed problem solving protocols are dependent on the systematic elimination of dependent variables. It would have been easily tested in the i2LR laboratory by using arenas with and without harborages, but the i2LR protocol did not consider this crucial and telling comparison.

Intellitec Protocols are more suited to answering the central question than the i2LR protocols

For two reasons, the Intellitec protocol and experimental setup is more suited to answering the central question with discriminating data than the i2LR protocols. In my opinion, the central question of the research is this, "Does a B+H Ultrasonic Pest Repeller #50167 repel German cockroaches and Odorous house ants?"

Reason one: No artificial harborage or other sound shadowing structure was used in the Intellitec chambers. It was argued above that such harborages and structures only serve to confound the results, rather than clarify.

Reason two: the Intellitec chambers were constructed from nonporous plastic, which according to Dr. Potter is a less favored substrate for pheromone deposition compared to porous substrates like (cardboard and) wood (Potter, para 89), with which the i2LR cambers were constructed. Dr. Potter states (para 36),

> *"The fact that cockroaches and ants tended to remain on the side where first introduced was likely aided by aggregating factors (e.g., pheromones)*

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associated with the supplied harborage. Cockroaches and ants deposit pheromones in harborage locations within dwellings. This results in 'aggregations' (with cockroaches) and 'nests' (with ants)".

Since pheromones mediate insect aggregation and behavior (Ref. 10) and in this case stimulate aggregation and nesting, an experimental chamber that minimizes pheromone deposition is desired because it would minimize the particular confounding factor of aggregation and nesting in an experiment designed to simply discern whether B+H Ultrasonic Pest Repeller #50167 repels German cockroaches and Odorous house ants.

Insect and spider satiety interferes with experimental objective

The animal husbandry records subpoenaed from i2LR (Ref. 23) indicate that for at least 20 days prior to the initiation of the tests, the stock populations of German cockroaches used in the tests were provided with ample food and water (Ref. 24). The i2LR report states, *"Prior to arthropod introduction, each test enclosure was stocked with food..."* (Ref. 3). Inherent in these procedural steps is the lack of recognition that fully satiated German cockroaches are less prone to forage for food or water than starved (food/water deprived) individuals or colonies. Starving test insects prior to any laboratory research seeking to understand and quantify behavior associated with locomotion, e.g., repellency, is a commonly employed procedural step and practice by seasoned expert research entomologists as a precursor to test initiation. C. Y. Lee starved the German cockroaches used in his research for three days (Ref. 11) and six days (Ref. 12) to meet his experimental objectives. El-Sharabasy starved the German cockroaches he used in his food choice tests for three days prior to test initiation (Ref. 13). The cogent point to be made in this section is that Dr. Potter used insects that were not encouraged to leave their harborages on a food/water foraging expedition. It is, therefore, not surprising to me that i2LR noted in their Results section (p. 11) that most of the *"(cockroaches) remained in the harborage"* and *"The ants remained in their introduction chambers for the duration of the test ..."*. The ability to achieve the experimental objective and obtain discriminating results that are dependent on insect locomotion was seriously compromised from the very beginning. The insects had no reason to exit their harborages to be exposed to ultrasonic sound under the i2RL protocol because, a) aggregation pheromones encouraged them to remain in the harborage, and b) their fully satiated state discouraged them exiting the harborage to forage for food/water.

The food and watering regimes for the stock odorous house ant colonies and cellar spiders that were used in the tests, prior to the experimental start date, were not provided in the subpoenaed documents (Ref. 23 and Ref. 24).

Specifically, considering the odorous house ant results, foraging research of Barbani (Ref. 14) and others on these ants validates my assertion that that the individual worker ants of the various colonies used in the i2LR tests would not be expected to venture out of their harborage in search of food/water, i.e., the colonies were satiated, with no need of additional food/water. Barbani's results,

"indicated that odorous house ants do not strongly discriminate between time of day or night when foraging ... When an acceptable food source is encountered, foraging trails are immediately established to the source and foraging continues

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> *throughout the day and night until the resource is depleted or is no longer desirable."*

Supporting Barbani's results is a passage taken from Mallis, 6th edition with respect to odorous house ants, *"The workers forage tirelessly night and day in trails ..."* (Ref. 15). These passages from peer-reviewed publications suggest that odorous house ants would normally be readily seen foraging outside of their nest harborages unless some externality discouraged them from doing so. In the i2LR tests, the discouraging factors could be satiety, aggregation pheromones and/or the ultrasound. Since i2LR did not report any ant movement (except for one ant) for the entirety of the test, whether in the control chambers or the Bell+Howell Repeller #50167 chambers, the experimental objective, which was dependent on ant movement, was not realized – a serious flaw emanating from the design of the experiment.

An error in the i2LR report prevents us from knowing with certainty the species of spider used in their tests. Two species of spiders are specified as being used: *Physocyclus globosus,* common name: short-bodied cellar spider, (Aranae, Pholcidae) (Page 6) and *Achaearanea tepidariorum,* common name: common house spider, (Aranae, Theridiidae) (Page 15 and Ref. 23). Fortunately, this discrepancy does not alter the point to be made in this section. Since both species of spiders make typical tangle webs, likely found in corners, or at the angular point of contact between baseboards and floors, or the angulation of abutting walls, their prey-obtaining behavior is similar. Both species rely on prey to walk or fly into the web (Ref. 17 and Ref. 22). Of interest is G. B. Edwards' published observation on the common house spider, that *"(it) feeds on a variety of prey, including German cockroaches"* (Ref. 16) and A. L. Turnbull's published common house spider research (Ref. 17),

> *"If selected (web building) sites fail to yield an adequate supply of prey they are quickly abandoned. If adequate supplies of food are forthcoming at a site, random movements cease and the site is systematically searched by filling the area with web."*

In the context of this section, the experimental objective, which is dependent on spider movement, is compromised since, the spiders were regularly fed and satiated with prey. A better design would have been to not feed the spiders to encourage movement around the chamber for suitable web-building sites, per Turnbull's research, and then compare overall movement in the Release and Non-release chambers.

<u>Introduction of food is inconsistent with and violates product use instructions</u>

Another deficiency inherent in the i2LR protocols related to food is that the intentional provision of food for all arthropods violates one of the "Tips for Increasing Product Efficiency" included in the text of the B+H Ultrasonic Repeller #50167 Owner's Manual (Ref. 18). The relevant instruction is, *"Make sure that all food is put away. The smell of food attracts pests and will decrease the efficiency of the Ultrasonic Pest Repeller."* This clear instruction is yet another reason that food should not have been provided to the test arthropods during the i2RL testing. Evaluating a product contrary to its intended use for these purposes is inappropriate and unjustified.

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To summarize this and the preceding section, whether for satiety reasons or instruction non-compliance reasons, the fact that food/water was readily and regularly provided to all test arthropods was a procedural error that compromised the experiment and negated the capacity to obtain discriminating results, and thereby, the objectivity necessary for achieving the experimental goal.

Clean chambers not used for some experiments

Dr. Potter claims that, *"...failure to clean enclosures between experiments could further bias results"* due to the persistence of attractants in arthropod secretions (Ref. 2, para. 89). His criticism of the Intellitec protocol is that there was *"no mention"* of any cleaning in between trials. It is odd, then, that the protocol collaboratively designed by Dr. Potter and used in the i2LR tests does not prescribe cleaning enclosures between experiments either, nor is there any "mention" of "cleaning enclosures" in the i2LR report. Does this procedural shortcut further bias results of Dr. Potter's commissioned i2LR research as he alleges might be the case for the Intellitec research? It remains an open question since he did not commission a separate investigation to test his allegation of bias due to non-cleaning.

As evidence of this shortcut, see Figure 1 in the i2LR report (Ref. 3, p. 7). It is captioned, *"Enclosure used for cockroaches and spiders. Device located in left enclosure (.)"* On Page 11, writing about the cockroach results, the authors state, *"Their presence inside the connecting tube was confirmed when it was time to remove them and introduce the spiders for the next testing phase."* Without the mention of a *"cleaning enclosures"* procedural step between the cockroach, spider and ant tests we can justifiably levy the same criticism of the Dr. Potter-sanctioned protocol that he levies against the Intellitec protocol.

Intellitec chamber size vs. i2LR chamber size are both lab scale

Dr. Potter uses the entirety of his paragraph 87 to criticize the *"small"* chamber size of the Intellitec experiments as being insufficiently small compared to *"the size of a typical room"*. The lab-scale Intellitec chambers were 4 x 4 x 1.5 foot in size (24 ft^3). The lab-scale i2LR chambers were 3 x 3 x 3 foot in size (27 ft^3). The three dimensional space in the i2LR chambers was only 1.125 times larger (11.1%) than that of the Intellitec chambers. In my opinion, both are reasonable sizes for laboratory scale research and the extra 3 cubic feet of space available to the arthropods in the i2LR tests is not enough practical difference to criticize one over the other. It is true, though, that Dr. Potter has not tested the size of either chamber to objectively draw such a conclusion.

T-Tube choice setup better than i2LR setup

In consideration of the totality of all the deficiencies cited in this chapter regarding the existing i2LR experimental setup and protocol, Dr. Potter should have employed a design very commonly used in urban pest research. By adapting the "T-tube design" to the B+H Ultrasonic Repeller #50167 efficacy research, i2LR may have collected data that actually 1) was discriminating and 2) satisfied the experimental objective. The recommended setup (Figure 1, Appendix 1) eliminates the negative control for device issue, the harborage sound shadow issue, the harborage aggregation pheromone issue, and the satiety issue. In so doing, it would have encouraged the test individuals to move from the Introduction Area and choose one of two chambers (Repeller ON or Repeller OFF) in search of food.

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Statistical Assessment of i2LR Data Shows Experiments are Flawed

Control Chambers failed to operate as necessary

The i2LR protocol incorporated a connected pair of Control chambers, with the B+H Ultrasonic Repeller #50167 affixed to one chamber and the other chamber without a Repeller. It was pointed out above that this is a deficiency in the protocol, since a negative control was lacking. But dismissing that flaw for the moment, it is noted that the pair of Control chambers was intended to serve as a "check" or comparison against which the matching pair of Treatment chambers could be tested (one chamber with the Repeller turned ON for the duration of the test). The matching pairs of two connected chambers were described as being alike in every way – except for an operational Repeller in one of the four chambers.

In such an arrangement, the arthropods in the Control chambers are expected, given sufficient time, to freely move between chambers, showing no preference for one chamber over the other. The result of such free movement would be observed as an equal number of individuals occupying each chamber. In this context, the pest distribution across the paired control chambers is considered to be "equal" if the difference is not significantly different at some level of probability. Conversely, if the distribution of individuals is not "equal", i.e., significantly different, then it can be safely assumed that the individuals are showing preference for one chamber over the other, and all conditions are not equal.

I used the chi-square test to test for "no location preference" for each pest on each assessment day (15 independent chi-square tests). I summed the counts across each of the three replicates for each Day x Location. Per the i2LR report, "missing" pests would have been located in the connecting conduit. I added the missing pests in the conduit to the pests counted in the Non-release chamber, since by definition, they were not found in the Release chamber. The results of the chi-square tests are found in Table 1 of Appendix 2. Each one of the 15 chi-square tests for location non-preference was very highly significant ($P \leq 0.0001$), an indication that rejecting the null hypothesis of non-preference is without significant risk (H_o: *number of pests in Release Location = number of pests in Non-release + Conduit Location*).

Results such as these should have raised a red flag to the i2LR researchers that something was awry. In fact, even researchers referenced in Dr. Potter's report adhered to this experimental expectation and documented that their control chambers were operating as necessary during the pre-treatment phase of their experiments. Huang, et al. write, *"Ants in each enclosure after two days (pre-test acclimatization) was equal (31-32/enclosure)"* (Ref. 26). In 2006, Huang and Subramanyam write, "

> *These results suggest that the insects were evenly distributed between the paired enclosures in the control tests and in the tests with the ultrasonic devices before the ultrasonic units were turned on."* (Ref. 27)

Since the objective of this research was fundamentally based on the pests' ability to freely move between connected Control chambers, anything that impedes, halts, or restricts that movement represents a flaw in the experiment. Even without the benefit of statistical analysis, when, after the acclimation period (Day 0, 1, or at least by Day 3), the i2LR researchers continued to empirically observe

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no movement toward equal dispersal between both Control chambers the experiment should have been terminated and the protocol revised to correct for the inherent preferential bias in favor of the Release chamber. Another possible remedy might have been to extend the duration of the test until the arthropods in the Control chamber behaved in the expected manner, i.e., showing no preference between the pair of control chambers.

It appears that Dr. Potter either expected or was surprised by this bias, in either case, attempting to explain it away by attributing it to aggregation pheromones in the harborage. It is my opinion, as pointed out above, that satiety also contributed to the lack of motivation for the pests to move from the initial release chamber. It is my opinion that had the i2LR scientists starved the pests before the test, not provided *ad libitum* food/water during the test, and not introduced them into the release chamber in harborages that were never removed, the pests would have had a greater tendency to move freely between the connecting chambers and there would not have been a significant difference in the number found in each pair of control chambers.

In an effort to mathematically correct for this inherent bias, it appears that the i2LR researchers chose to express and analyze their results using a calculated "*percent movement*" metric (Ref. 3, p. 10) or "*percent movement relative to control*" (Ref. 3, p. 12) that serves in a mathematical sense to standardize incongruous data (view embedded formulae in Ref. 23). The problem is, and as importantly demonstrated in Appendix 2, I have shown that there was no significant movement of the pests in the Control chambers.

The authors of the i2LR report conclude that "*the Bell+Howell Repeller #50167 ultrasonic device was not effective at repelling cockroaches, spiders or ants during the trial duration*" (Ref. 3, p. 5). In paragraphs 34 – 37 of Dr. Potter's Expert Report, he restates the Insect and Spider results from i2LR and endorses their conclusion by quoting it word-for-word. In my opinion, their conclusion falls somewhere between being overstated and erroneous. Given the lack of free movement observed of the pests between the Control chambers, their analyses are essentially only as good and valid as results arising from of "divisions by zero", which have no meaning.

Furthermore, having collected data on five different days for each pest, it is baffling to me why i2LR only analyzed and based their conclusions on those data collected on the last day of each experiment. A more elaborate and appropriate set of analyses would have been to analyze all the data and correct for the location of the pest on the previous counting day, as Dr. Potter implies in his Expert Report (para 85).

i2LR Results are mixed: Generalized conclusions are misleading

Notwithstanding the discussion above, the i2LR authors and Dr. Potter acknowledge the statistical significance of the German cockroach percent movement on day 10 of treatment, but, in my view they minimize this result (which is in favor of the B+H Ultrasonic Repeller #50167) and do not give it due credit. The i2LR report summarizes results this way,

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> *"Overall, directional movement away from the enclosures containing the devices was not observed in any of the species, with the exception of one replicate out of three of the treated cockroaches, which exhibited statistically significant movement on day 10 of treatment (however, this replicate still demonstrated <40% percent [sic] movement)."* (Ref. 3, p. 5).
>
> *"After 10 days of constant, 'point blank' exposure, only 13% of cockroaches overall were found on the opposite, untreated side of the enclosure. Virtually all of this movement occurred in one replicate, yet still demonstrated less than 40% movement in respect to the control."* (Ref. 2, para 34)

In actuality, the statistical analysis shows that the movement of German cockroaches was not just "*statistically significant*", it was very highly statistically significant with a p value <0.0001. It is disingenuous to conveniently discount this result. "Replication" is a fundamental component of the scientific method. Replicate 2 is as important to the overall result as Replicate 1 and Replicate 3 and, therefore, must not be discounted or minimized – for to do so is in opposition to the scientific method. If the authors were suspicious that this result was an anomaly, the scientifically proper recourse would have been to repeat the experiment.

Close inspection of the i2LR raw data table (Ref. 3, p. 15) again, begs the question of why the authors did not perform the same statistical analysis on all of the days that cockroaches were counted, instead of just Day 10. Might it be that the roaches' movement away from the Repeller chamber on Days 1, 3, 5 in Replicate 2 is also statistically significant?

The differential cockroach movement appears even more obvious and dramatic (and perhaps statistically significant) if we were to implement my assertion that "missing" roaches should be considered and counted with those visually observed and counted on the non-release side. I maintain that this inclusion is legitimate because, by definition, if they were not seen in the Chamber with the Repeller than they were elsewhere, either in the Non-Release Chamber or between the chambers in the sound-shadow of the connecting conduit tube. In the Assessment section of the i2LR report it is written,

> *"Only in the interior of the cardboard connecting tube were assessments not made in the case for cockroaches and spiders. For ants, visual observations were also made, and an endoscope was used to locate any ants within the pipe.* (Ref. 3, p. 9)

And on page 11, writing about the cockroach results, those authors state, *"Their presence inside the connecting tube was confirmed when it was time to remove them and introduce the spiders for the next testing phase."*

I made the corresponding intentional modification discussed above to a portion of the i2LR Raw Data Table (p. 15). Table 1, below, shows the German cockroach raw data for the Bell+Howell Repeller #50167 treatment. The modification occurs in the Non-Release Side columns for Replicates 1 – 3. The data in the Non-Release Side columns includes the modified counts and, in parentheses, the originally reported counts by i2LR for comparison. I also included the Mean +/- SD columns.

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Table 1. Modified i2LR raw data table for German cockroach to show the numbers of roaches observed in the non-release side plus the number of roaches missing or unaccounted for due to their presence in the connecting tube.

Treatment	Bell+Howell Repeller #50167							
	Replicate 1		Replicate 2		Replicate 3		Mean +/- SD	
Day	Release Side (with device)	*Non-Release Side	Release Side (with device)	*Non-Release Side	Release Side (with device)	*Non-Release Side	Release Side (with device)	*Non-Release Side
0	99	1 (0)	99	1 (0)	100	0 (0)	99.3 +/- 0.47	0.7 +/- 0.47 (0.0 +/- 0.00)
1	92	8 (0)	69	31 (4)	96	4 (0)	85.6 +/- 11.90	14.3 +/- 11.90 (1.3 +/- 1.86)
3	90	10 (0)	80	20 (14)	91	9 (0)	87.0 +/- 5.00	13.0 +/- 5.00 (4.7 +/- 6.60)
5	95	5 (0)	57	43 (10)	90	10 (0)	80.7 +/- 16.86	19.3 +/- 16.86 (3.3 +/- 4.71)
10	88	12 (0)	47	53 (31)	90	8 (2)	75.0 +/- 19.82	24.3 +/- 20.33 (11.0 +/- 14.17)
TOTAL	464	36 (0)	352	148 (59)	467	31 (2)	427.7 +/- 53.52	71.7 +/- 54.01 (20.3 +/- 27.35)

* Non-parenthetical counts represent the SUM of the Original reported counts in Non-Release Side plus the number of "missing" roaches located in the connecting conduit tube and not visually observed for counting. Original reported counts by i2LR scientists are in parentheses.

I draw attention to this modified table for three reasons, 1) to support my open question of why the authors did not run the statistical analyses on all days of testing, instead of just Day 10, and 2) to illustrate that when looking at all replicates (which is the proper approach), on average, there was detectable movement into the non-release side on all days (statistical difference is unknown), not just Day 10, and 3) to appreciate the considerably different counts and likely conclusions that would emerge had the authors understood that the roaches they did not look for in the connecting conduit tubes, should be included as part of the Non-Release side (repelled) population. Undoubtedly, the k-proportion statistical analysis test that i2LR used to support their conclusions would produce different results and perhaps yield different conclusions had they used the data that I prepared and present in the modified table (Table 1).

In summary, their generalized conclusion statement, *"... the Bell+Howell Repeller #50167 ultrasonic device was not effective at repelling cockroaches, spiders or ants during the trial duration."* (Ref 3. p. 5) is inaccurate and misleading. A deeper drill into the raw data, assessment procedure, and statistical analyses (or lack, thereof), shows that there was more cockroach movement away from the repellers than stated or implied in their report. It's not appropriate to conclude anything from the spider and ant tests, since there was no appreciable movement of the pests in the Control Chambers. Without such movement in the Control, no valid comparison to the treatment chambers can be made. It is disingenuous to conclude with general statements when the underlying results are mixed, as are the i2LR results.

It should be noted, for the record, that despite the many zeroes reported for odorous house ant movement in the final i2LR report (Ref. 3), these data are not supported by the subpoenaed raw data file for this pest. Only empty cells appear in Ref. 23 for odorous house ants.

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Rebuttal of unanimous "Failed" labeling of previous peer-reviewed Test Results

Dr. Potter includes a summary table of the peer-reviewed studies that he evaluated for the purposes of his Expert Report, Chapter IX (Ref. 2). He attached the label "Failed" to each of the 18 studies examined. Presumably that label means that the ultrasonic and/or electromagnetic device tested "failed" to repel the subject pest, with the unanimity supporting his conclusions that the "*devices are ineffective for their stated purposes*." My rebuttal of his labeling is based on a careful review of three of the references that he labeled as "Failed".

Looking at the details within Ballard et al. (Ref. 19), I find the following passages:

- *"... significantly fewer cockroaches were found in the ultrasonic active cube"*
- *"When the influence of ultrasound was evaluated ... significantly fewer cockroaches ($P \leq 0.10$) were found in the cubes containing an active ultrasound device than in the connected cubes with an inactive device (Table 2)."*
- *"Although the results of this experiment indicated that cockroaches responded to ultrasound under these test conditions, the experiment was repeated with an improved design."*
- *"[From the improved design] the analysis of data indicated a significant increase ($P \leq 0.10$) in the rate of cockroach catch in the cubes with an active ultrasound device."*
- *"Ultrasound caused an increase in movement in the confined cockroach population, which resulted in a significant increase in cockroach catch."*
- *"The use of ultrasound in these experiments resulted in a statistically significant increase ($P \leq 0.10$) in activity by the German cockroach population."*

To be fair, the authors also state, "*However, the biological importance of these observations is difficult to interpret.*" But, insofar as labeling this research with a Pass/Fail designation, I strongly contend that it did not "Fail" to repel German cockroaches and rebut the label given by Dr. Potter. Conversely, the data and authors' text indicate that the Ultrasonic Device did significantly repel German cockroaches, and therefore is mislabeled by Dr. Potter.

The second reference that I closely examined was the Subramanyam reference (Ref. 20), which appears to be a PowerPoint file. Interestingly, Dr. Potter does not include Subramanyam's cockroach results in his summary Table of previous research on ultrasound. I find on Slide 23 of this presentation a summary of seven ultrasonic tests on cockroaches. Subramanyam reports the tests as S/F (presumably Success/Fail). Taking those seven studies, conducted between 1983-1991, into account, we find that Subramanyam gave the ultrasonic repellers a 31% success rate (13/42, S/F). Yet Dr. Potter does not include these results in his Pass/Fail table.

In the same presentation, Subramanyam summarized results of ultrasound tests on spiders. Dr. Potter did include this subset of the presentation in his review and also labeled the results as "Failed". However, on Slide 61 we see that two of the three devices resulted in significantly less spider captures than the captures from the control rooms. In a separate spider study, we see on Slide 64 that one of the three devices being tested resulted in significantly less spider captures compared to the control. In a

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third spider study, using a smaller test enclosure, no significant difference was found in spider captures compared to the control. As above, I rebut Dr. Potter's labeling of Subramanyam's spider tests as "Failed" based on the fact that in two of the three spider studies Subramanyam counted significantly fewer catches in the Repeller chamber compared to the Control chamber.

The third reference that I closely examined was the Huang and Subramanyam 2006 (Ref. 27) study on German cockroaches. Within the Results section of the publication they write,

> *"In the paired tests with ultrasonic devices after one unit was turned on (active), the number of cockroaches in the enclosures with active ultrasonic units was consistently lower than that found in the enclosures with inactive units for all the three devices and throughout the 6-day period ... However, the paired t-tests indicated that these differences were not significantly different (P > 0.05) for all three devices and throughout the 6 days except for device B on day 6, which was significant (t=3.73, P=0.0336)."*

Despite the one significant exception noted, they conclude, "*These results indicate that ultrasound produced from these devices did not repel cockroaches in the test conditions.*" This is a generalized conclusion that is not attentive to detail by failing to take into account the exception.

In summary, the unanimous "Failed" pronouncement that Dr. Potter ascribes to these historical tests is in error. In fact, his summary of the previous research should conclude that efficacy results across the 18 studies were "mixed", not unanimously "failed". He is, therefore, misleading in stating that all Ultrasonic Repellers are ineffective since I have extracted at least three cases in which the repellers should have been labeled as "passed". This discussion leads to further doubt and calls into question what the outcome would be had I accessed and closely investigated all the papers, as done for the three mentioned above.

Decisions are made based on the data in hand

All researchers and decision-makers draw conclusions and make decisions based on the data in hand. Every credible scientist with that responsibility uses all the data available to him/her in some way. Whether the generating source of those data are internal or external employees, it is standard practice to use all data in hand in the decision-making process.

Intellitec's experimental protocols, data and conclusions are criticized throughout Dr. Potter's Expert Report as being flawed. As is standard practice within the industry, Intellitec used the data in hand, generated by their contract labs, to make decisions and help write the packaging and Owner's Manual text that accompanied their product and justify the claims made therein. It is a given that with every iteration of an experiment, an astute researcher learns from the previous and improves experimental methodologies so that subsequent runs more accurately, precisely and efficiently approximate truth. If time and/or resources were not constrained, most fastidious scientists would keep testing, improving, testing, improving, testing, improving, etc. until all doubt (variability) is removed. Unfortunately, never

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(in my career experience) have time and/or resources not been constrained. So, decisions have to be made whenever time and/or resources are exhausted.

Similarly, I have exposed numerous "deficiencies" in the i2LR protocols which Dr. Potter designed in collaboration with other experts of his choosing. If there were no time and/or resource constraints placed upon him, I believe he, like others, would improve the protocols, test again, improve again, and test again, etc. until all doubt (variability) is removed.

My point is this: it is a given that the word "flawed" could be used in this case. It does not impress me or conjure up anything unusual or unexpected to me. I believe that it's possible to find "flaws" in any experiment, just as I have found deficiencies (aka flaws) in the i2LR research. It's also obvious that labeling something as "flawed" is a judgement call, a personal opinion that may or may not be accepted by others who have different values and perspectives. However, I do take issue when the word "flawed" is connected in context with the word "erroneous". When these two words are connected, the implication is that the flaw is a "mistake", a more grievous accusation that I do not believe is warranted in this matter.

Tests of Non-Bell+Howell Ultrasonic Repellers are irrelevant

Dr. Potter devotes an entire chapter of his Expert Report, "Chapter IX: TESTING OF COMPARABLE DEVICES SHOWS THAT THE ULTRASONIC AND ELECTROMAGNETIC TECHNOLOGY USED IN THE BELL + HOWELL DEVICES IS INEFFECTIVE", to the review of existing, historic peer-reviewed research published in scientific books, journals and university publications. Dr. Potter attempts to justify the review and its relevance with this statement, *"Thus, inferences regarding the effectiveness of the Bell + Howell devices may be reliably drawn from studies measuring the effectiveness of other devices bearing the same ultrasonic and/or electromagnetic properties, as detailed below."*

The P. G. Koehler, et al. (Ref. 21) publication (included in Dr. Potter's review) includes this sentence in the abstract, *"All devices tested produced ultrasound, but the quality of the sound differed for each device."* They were testing nine commercially manufactured ultrasound pest control devices. The summary sentence is cautionary. It serves to cast doubt on the validity of assertions made by Dr. Potter, that the results from previously tested ultrasonic devices are relevant and applicable to those of untested ultrasonic devices.

Huang and Subramanyam (Ref. 27) (included in Dr. Potter's review) postulated in their discussion of the positive ultrasonic results of Ballard, et al. (Ref. 19) in repelling German cockroaches that those results, *"... might be due to the differences in the sound properties produced from the device tested."*

Included within the B. Subramanyam reference (Ref. 20) (and also reviewed by Dr. Potter) as part of his Overall Conclusions, are the two bullet points,

- *"The effectiveness of devices against arthropod pests cannot be ascertained without testing specific ultrasonic units"*
- *"Effectiveness varies with the protocol used"*

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I could not source all of the publications included in Dr. Potter's Chapter IX review. But for those that I did access, none included a Bell+Howell Ultrasonic Repeller in the list of tested devices. Given the caution arising from the Koehler, et al. abstract, the Huang and Subramanyam discussion point, and the direct warning by Subramanyam, there is unknown risk associated with statements that infer any correlation between tested and untested ultrasonic devices.

Dr. Potter cites Ms. Feuerstein's testimony, in which she indicates that the Bell + Howell devices were modeled after other brands' devices and that the ultrasonic sound waves they emit "*may still be effectively identical (emphasis added)*" (Ref. 2, para 54). The context of Ms. Feuerstein's testimony was the electronic properties of ultrasonic devices, i.e., frequency (kHz) and loudness (dB). Ms. Feuerstein did not comment on the directional attitude or size or number of internal speaker(s) in Bell + Howell devices. Since ultrasound is unidirectional, the directional positioning of the speaker(s) within the case is vitally important to the effectiveness of the device. Speaker number, size and direction are examples of several independent variables/components within all ultrasonic brands and models that can vary and thus variably affect device efficacy. This goes to my opinionated position that it's incumbent upon scientists to stay the conservative course and not assume or make misleading proclamations that an untested device would perform as well or as poorly as tested devices, under the same experimental conditions, even if certain other variables, components and functionalities are similar.

In summary, Dr. Potter's claim that

> *"... inferences regarding the effectiveness of the Bell + Howell devices may be reliably drawn from studies measuring the effectiveness of other devices bearing the same ultrasonic and/or electromagnetic properties, as detailed below.",*

is both directly and indirectly refuted by at least three of the very researchers that he cites in support of making the inferences. They are contradictory to his relevancy premise. In my opinion, which is based in conservancy and supported by the Koehler, Huang and Subramanyam, and Subramanyam, statements, the non-Bell+Howell Repeller researches that Dr. Potter cites are irrelevant to the matter at hand and should be dismissed for his intended purpose.

Inherent bias throughout the Potter report

Careful examination of the Bell + Howell Ultrasonic Repeller packaging and Owner's Manual text reveals no claim of pest "control" or that the device will drive pests out "of buildings" (Ref. 18). As indicated in my previous report (Ref. 1), I have many years of experience in the pest management industry, occupying many product development roles with a previous employer. As the lead R&D biologist/entomologist on various product development teams, it was my responsibility to write, review, and approve the technical language, including Use Directions, on the developmental insecticide, fungicide and herbicide labels and product literature prior to and after commercial launch. It is standard practice within the industry for the Product Development Manager and/or Leader to consider and scrutinize every word, phrase and sentence that appears, or does not appear, on those labels and associated product literature. The goal is for the final draft to be true, supported by the data in hand and, thereby, defensible. Based on my experience with reviewing and approving pest management

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product literature, it is reasonable and not unexpected to read language on the B+H Ultrasonic Repeller packaging and Owner's Manual such as: a) *"Fast and effective ultrasonic sound waves to help repel unwanted pests"* – noting there is no mention or claim of pest "control" and b) *"Plug it in ... Drive Pests Out!"* – noting there is no mention or claim of driving pests out "of buildings".

In as many as five instances throughout his Expert Report, Dr. Potter uses the words/phrase *"control"* and *"... out of buildings"* to describe the claims made by the Defendants. In my opinion, such a careless use and insertion of those words is indicative of a bias that Dr. Potter brings into this case. Exactness is of critical importance when presenting as an Expert Witness. As part of this Rebuttal Report, I submit that Dr. Potter has exaggerated, perhaps unconsciously, the actual claims made within the Bell + Howell Ultrasonic Repeller product literature. If the mistaken representations were unconsciously written, it would indicate an unconscious and inherent bias against ultrasonic technology that might influence his design of experimental protocol, interpretation of results, conclusion formation and report writing. Harboring bias, whether intentional or unintentional, is not an admirable quality when seeking to convince with universally accepted scientific methodology, under which, bias is sought to be eliminated or accounted/corrected for.

Another example of apparent bias that Dr. Potter harbors against the B+H Ultrasonic Pest Repeller is demonstrated in his writing and assertions made in Paragraph 18 of his report that are contradictory to his own practice. He states, in essence, that laboratory scale experiments on ultrasonic technology would not predict any practical use in a real-world setting. Yet, instead of using real-world settings himself to test the effectiveness of the B+H Ultrasonic Repeller #50167 on arthropods, he too designed a laboratory scale protocol for i2LR to implement on behalf of the Plaintiffs. If laboratory scale experiments are sufficient for Dr. Potter to draw conclusions which he uses to predict real-world settings, then shouldn't others researching ultrasonic technology be afforded the same privilege?

Summary

In rebuttal to Dr. Potter's Expert Report, I have exposed numerous serious deficiencies that were inherent in the i2LR research protocol and experimental design for cockroaches, spiders and ants. Among others, the deficiencies include biotic, abiotic, procedural, statistical, and the physical set-up. On the basis of these deficiencies alone, Dr. Potter's assertion that the B+H Ultrasonic Repellers are ineffective should be dismissed as inaccurate and misleading.

I have rebutted Dr. Potter's use of "comparable devices" to infer that the B+H Ultrasonic Repeller #50167 is ineffective against cockroaches, spiders and ants. He relies on published tests of non-Bell+Howell Ultrasonic Repellers to make this inference. In fact, three of the so-called comparable devices that he used in defending his assertion were tested by researchers who contradicted his position directly or indirectly by writing that the *"quality of sound differed for each (tested) device"* (Ref. 21), differences in ultrasonic results *"might be due to the differences in the sound properties produced from the device tested"* (Ref. 27), and that *"effectiveness of devices against arthropod pests cannot be ascertained without testing specific ultrasonic units"* (Ref. 20). In my opinion, the dismissal of non-Bell+Howell Ultrasonic Repeller tests as irrelevant is justified and consistent with the principles and

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practice of generally accepted scientific methodology, which calls for valid comparative testing against specific null hypotheses.

Without valid experimental data from the i2LR research program or relevant testing using Bell+Howell Ultrasonic Repellers in the same published tests as other ultrasonic repellers, Dr. Potter is only left with his opinions and biases to defend his conclusion, *"... the devices are ineffective for their stated purposes and can neither repel nor drive out any of these critters (ants, cockroaches, spiders, mice and rats)* (Ref. 2, p. 1). In this Rebuttal Report, I have also shown evidence of his bias against the Bell+Howell Ultrasonic Repellers. He writes repeatedly that the Bell+Howell Ultrasonic Repellers claim "control" of pests and the wherewithal to drive pests "out of buildings". Neither is true. The Defendants make no such claims in the product literature that I have examined.

For the reasons stated above and in Ref. 1, I opine that the Defendants had reasonable basis to make the claims as exactly stated on the packaging and in the Owner's Manual of the Bell+Howell Ultrasonic Repellers. Specifically, I refer to *"Fast & Effective ultrasonic sound waves to help repel unwanted pests"* and *"Plug it in ... Drive Pests Out!"* Based on the data in hand and testing conditions, such language was reasonable and appropriate.

Having demonstrated that Dr. Potter's i2LR experiments were deficient and flawed, I opine that with flawed data in hand, he arrived at false conclusions and indefensible generalized statements. I conclude this rebuttal by restating, with a one-word replacement, Dr. Potter's own words and allegation that, *"~~Defendants'~~ (Plaintiffs') flawed experiments yield false conclusions"* (Ref. 2).

Dated: December 22, 2017

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Appendix 1

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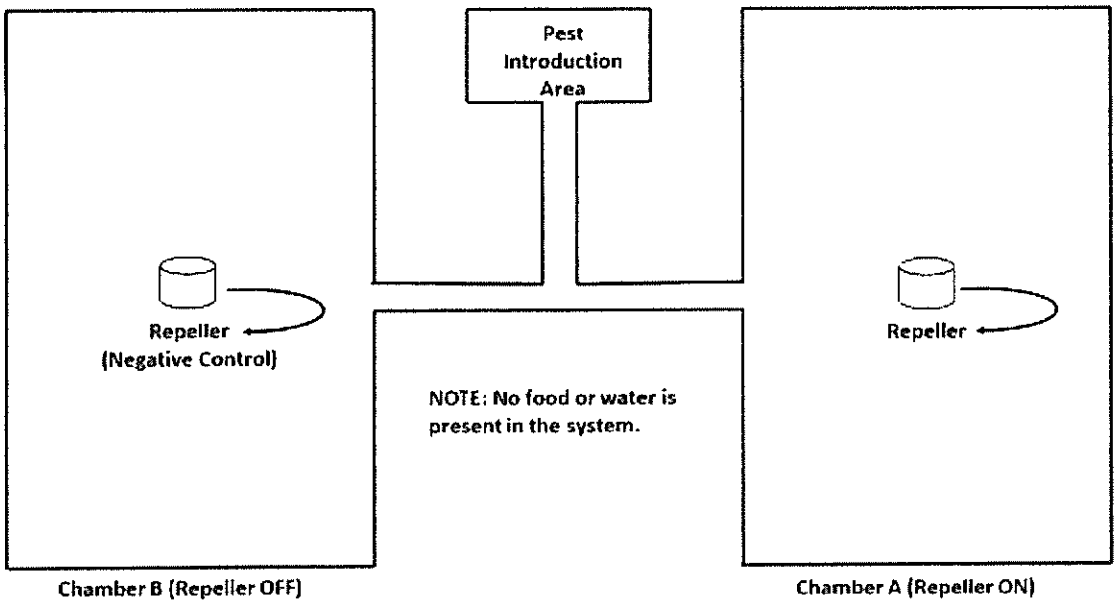
Figure 1. Crude schematic diagram of recommended experimental set-up: T-tube choice design.



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Appendix 2

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Table 1. Independent chi-square tests by day for Control chambers. Null = No location preference

Cockroach	Location	Observed	Expected (50:50)	chi sq P value
Day 0 - CONTROL	Release	300	150	**
	Non-release+Conduit	0	150	3.29436E-67
Day 1 - CONTROL	Release	241	150	**
	Non-release+Conduit	59	150	7.95482E-26
Day 3 - CONTROL	Release	283	150	**
	Non-release+Conduit	17	150	3.15425E-53
Day 5 - CONTROL	Release	277	150	**
	Non-release+Conduit	23	150	1.08501E-48
Day 10 - CONTROL	Release	269	150	**
	Non-release+Conduit	31	150	5.77243E-43
Cellar Spider	Location	Observed	Expected (50:50)	chi sq P value
Day 0 - CONTROL	Release	45	22.5	**
	Non-release+Conduit	0	22.5	1.97034E-11
Day 1 - CONTROL	Release	44	22.5	**
	Non-release+Conduit	1	22.5	1.45461E-10
Day 3 - CONTROL	Release	44	22.5	**
	Non-release+Conduit	1	22.5	1.45461E-10
Day 5 - CONTROL	Release	43	22.5	**
	Non-release+Conduit	2	22.5	9.84401E-10
Day 6 - CONTROL	Release	41	22.5	**
	Non-release+Conduit	4	22.5	3.47524E-08
Odorous house ant	Location	Observed	Expected (50:50)	chi sq P value
Day 0 - CONTROL	Release	410	205	**
	Non-release+Conduit	0	205	3.66544E-91
Day 1 - CONTROL	Release	410	205	**
	Non-release+Conduit	0	205	3.66544E-91
Day 3 - CONTROL	Release	410	205	**
	Non-release+Conduit	0	205	3.66544E-91
Day 5 - CONTROL	Release	409	205	**
	Non-release+Conduit	1	205	2.70838E-90
Day 7 - CONTROL	Release	409	205	**
	Non-release+Conduit	1	205	2.70838E-90

ASTERISK & COLOR LEGEND:

** Chi-Square P Values ≤ 0.01

NOTE: Assuming Day 7-Control Release figure in Rep 1 of original Report is a typographical error and should be '150' not '15'

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